

COMPREHENSIVE RESEARCH ON PRUNES

PROGRAM AREA: Agricultural Engineering. Aerial Application Studies

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OBJECTIVES:

To increase application effectiveness and reduce chemical losses without increasing costs, for aerial applications of fungicides to control disease pathogens on prunes.

WORK IN PROGRESS:

Two sets of field runs on prunes were made in 1970. One set of 3 plots were run near Healdsburg on the Litten Ranch applying Defolitan for brown rot control. Only meager data was obtained from these runs as the amount of rot was low and control information was of little value. However, the feasibility and application techniques, using a Bell AG-5 helicopter, appeared good and tests will be continued in 1971 on this emulsifiable concentrate spray application.

The helicopter was flown at about 20 mph which appears to be a reasonable compromise speed which produces a good downwash of spray laden air, but still permits reasonable forward motion and productivity of this rather expensive (cost/hr) type operation.

Since fields are wet at this time (Feb.-March) the desirability of aircraft operation is obvious, but the coverage of twigs and buds is essential and the air-downwash of the helicopter gives evidence favoring them over fixed wing aircraft.

The second set of runs were made for pest control September of 1970 on the Jimeno Rancho, 7 miles North of Colusa. Replicated applications were made using 6% Maneb dust to 2 blocks of trees by Cessna Agwagon (fixed wing airplane) at 80 lbs/acre. Similarly ground dust applications were made with a Bean PTO aircarrier machine. A Besler air-Carrier ground sprayer was used to obtain spray vs dust data. Glass slide samples were taken as well as leaf samples. Analysis is continuing and is incomplete on these runs at this date, but will be summarized and presented in the next report.

Wind tunnel studies on controlled atomizers are being continued and in addition to the lab work a set of field runs were made with the nozzle and boom system on a fixed and on a rotary wing aircraft. Drop size is much too coarse and would likely be suitable only for systemic chemicals at present. However, promise is shown for reducing the average drop size and still holding down on the numbers of small air-borne drops.

EXPERIMENTS COMPLETED:

The first year of tests have been run, but at least 3 years of tests will be taken in order to reduce possible error in seasonal or other interfering factors.

WORK PLANNED:

Further field tests using ground and aircraft will be conducted in 1971 again starting with brown rot control in early March; Russet scab control in mid-summer and leaf rust control in the fall. Comparative data on dusts and sprays, coarse versus fine atomization and the controlled drop size boom will all be included. Work will continue on atomization control in the laboratory wind tunnel.

MAJOR ACCOMPLISHMENTS:

The first objective, that of the effective use of aircraft sprays on dormant prune trees seems to be at least in the acceptable category. Beyond this further experiments and careful evaluation of coverage and control will be needed to establish the relative effectiveness of aircraft versus ground operated equipment.

EVALUATION OF THE PROJECT:

The work accomplished to date points to the concept of aircraft use, particularly helicopters, as a very promising technique for more rapid, and effective as well as a means capable of ignoring wet orchard conditions. Whether the control can be sufficiently good to keep the various fungus diseases at economically acceptable levels or not remains to be proven, but this has been possible in other orchard crops and with new chemicals should be adaptable to prunes.

PUBLICATIONS:

None.